

# Assessment and Planning Feasibility Study St. James the Great Wellesley, Massachusetts



October 12, 2010

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Gale JN 714730

**ASSESSMENT AND PLANNING FEASIBILITY STUDY  
ST. JAMES THE GREAT  
WELLESLEY, MA**

**1. Project Description**

Gale Associates, Inc. (Gale) is pleased to provide the following assessment and planning feasibility study for a multipurpose recreational facility development at the St. James the Great Parcel located at 900 Worcester Street in Wellesley, MA. This study provides possible layouts for a multipurpose recreation structure (to include an ice rink, natatorium, and fitness center), a multipurpose rectangular field, related parking and other site amenities under the prevailing site conditions and site constraints as detailed on the existing conditions plan (please refer to Enclosure 3, Sheet SK-1). This study also outlines the permits and approvals required for the proposed project to proceed.

**2. Existing Conditions**

Gale reviewed several studies provided by the Town and visited the site to conduct a visual assessment of the existing conditions. The project site is approximately 7.85 acres of mostly developed land and is bounded by Worcester Street (Route 9) to the north, professional office buildings to the east, Dale Street to the west, and a mature residential neighborhood to the south.

The project site is located in a zoned Single Family Residence District and within the Town's Water Supply Protection District. The latter is an overlying district established by the Town in an effort to maintain groundwater recharge to the Town's wells by restricting the uses of a property within the district (see Enclosure 1, Figure 1).

The majority of the project site is paved and predominantly flat with a gradual slope running from the north to south, before transitioning to steeper slopes within the southern portion. There is a natural wooded area in the southern portion of the parcel. According to MassGIS data and the Town's Wetlands Map (see Enclosure 1, Figure 2), a portion of this wooded area is considered bordering vegetative wetlands and requires a 100-ft wetland buffer zone.

According to the latest FEMA Flood Insurance Rate Map, the northwest portion of the proposed site is located within flood hazard area "Zone A", commonly referred to as the 100-year flood plain (see Enclosure 1, Figure 3).

According to the latest NHESP Atlas, there are no Priority Habitats of Rare Species, no Estimated Habitats of Rare Wildlife, no Certified Vernal Pools, and no Potential Vernal Pools in the vicinity of the site (see Enclosure 1, Figure 3).

Soils information was taken from the USDA Natural Resources Conservation Service (NRCS) Soil Survey Report for Norfolk and Suffolk Counties as well as MassGIS data. The NRCS soils mapping indicates that the majority of the site's soil type is Urban Land (Ur), with 75% or more impervious surface and 0-15% slopes; the southern portion is Hinckley loamy sand (HfD), with 15-35% slopes (see Enclosure 1, Figure 4). Common attributes of HfD soils include rapid permeability (Hydrologic Group A), seasonal high water table (greater than 6-ft below surface), and a depth to bedrock greater than 60-inches. Due to the extent of impervious surfaces, Ur soils can have varying attributes. Test pits will be required to confirm the site's soil constraints.

The site's utility services (Town water, Town sewer, gas and electric) originate off of Worcester Street (Route 9). No formal drainage (catch basins, manholes, etc.) was observed within the paved areas on the site. Untreated stormwater runoff is currently allowed to sheet flow in a southerly direction towards the wooded areas and wetlands, and eventually offsite towards Morses Pond.

### **3. Proposed Development**

Gale met with Town officials and various user groups to refine the needs of the community and the associated recreational development priorities. As detailed in the attached Conceptual Layout (Enclosure 3, Sheets SK-2 and SK-3), the proposed development could potentially include the construction of a multipurpose rectangular field, the construction of a multipurpose recreation complex to include an ice arena, natatorium and fitness center, paved drives, paved walkways, stormwater collection and treatment best management practices (BMPs), and related site utilities in support of the intended use.

**Multipurpose Rectangular Field.** The overall dimensions of the multipurpose rectangular field were planned to be 210' x 360', and it would be able to accommodate competitive football, soccer, field hockey, men's and women's lacrosse events. The National Federation State High School Associations (NFHS) and Massachusetts Interscholastic Athletic Association (MIAA) guidelines were followed in the design of the field layout.

The field itself would likely consist of a synthetic turf surface on top of an engineered stone base and subsurface drainage system. The synthetic turf's infill would comprise of a mixture of sand and thermoplastic elastomer (TPE) granules, an environmentally inert material that is heavy metal, phthalate, biphenyl A, and vinyl free.

The field would be oriented in a north/south direction, which is the optimum solar orientation for playing fields. A four-pole MUSCO athletic lighting system would allow the field to be scheduled for nighttime events, thereby maximizing the number of uses for the field. When constructed, the proposed development would result in a high-use premium quality field for the Town.

**Multipurpose Recreation Center.** The multipurpose recreation center was planned to be comprised of three (3) interconnected building sections: the ice arena section, the natatorium (or municipal swimming pool) section, and the common area section.

The ice arena section was planned to be approximately 115' x 214' and be capable of housing a full size (85' x 200') hockey rink. Spectator seating could be provided along one side of the ice rink. An area for ice resurfacing machinery could also be included in this section. Other areas associated with the ice rink (such as team lockers, skate rental and pro shop) would be located within the common area section mentioned below.

The natatorium section was planned to be approximately 111' x 158' and would house a 25-yard competition pool with 8-lanes and a shallow end. There would be two (2) additional pools within the natatorium, a warm water pool and a tot splash pool. The warm water pool could be used for recreation and rehabilitation purposes. The tot splash pool could be geared towards the needs of younger children. Similar to the ice arena section, areas associated with the natatorium section (lockers rooms, family rooms, spectator seating) would be located in the common area section mentioned below.

The common area section was planned to be a two-story building approximately 59' x 170' and would be located in between the ice rink and natatorium sections. The first floor would comprise of the reception area, concessions, retail area with skate rental/pro-shop, locker room facilities, family rooms, public restrooms, and a shared mechanical room. The second floor would be comprise of spectator seating for natatorium, a fitness area, additional public restrooms, manager offices, and a class/party/meeting area.

As required by the Americans with Disability Act (ADA) and local building and fire-safety codes, elevators and stairs would be provided within the building's common area.

For the sizing of the public restroom facilities, Gale has assumed a total combined capacity of 2,000 persons. This capacity was based on an assumed design event of a scheduled high school hockey game along with some use of the swimming pools, fitness center and multipurpose field by residents and club teams. Based on this occupancy, the uniform state plumbing code (248 CMR 2.10), as it relates to places of general assembly, calls for the building to have 17 fixtures for males and 34 fixtures for females. Gale feels that this is excessive and that the smaller number (say 15 fixture for males and 26 fixtures for females) would be reasonable and possibly approved by waiver.

**Energy Efficiency and Sustainable Development.** Conventional refrigeration systems for ice arenas take heat from the ice making process and discard the heat to the outside air through cooling towers. Because of this

wasted heat, additional systems are needed to heat the rest of the building, often resulting in larger mechanical rooms and increased energy consumption.

The proposed design allows for the ice arena, natatorium and common area sections to be serviced by a single mechanical room. One way in which this could be accomplished is with an integrated system that consists of modular heat pump units and geothermal loops.

Maintaining the ice provides a constant heat source that can be used to provide heating for the common areas, swimming pools, domestic water and exterior snowmelt areas. The modular component of this system would allow for flexibility in operation. Thus, the system can simultaneously make ice, provide heating and air conditioning, provide water heating and provide dehumidification. Also, the geothermal loops would allow for the thermal storage of excess heat to be used when needed, reducing the energy demand of the system and may eliminate the need for fueled furnaces or boilers. Please refer to Enclosure 6 for examples of similar projects that have utilized energy efficient geothermal systems.

**Parking and Site Amenities.** The current design was planned to allow for approximately 200 parking spaces with 24'-wide driveways for two-way traffic flows and a designated bus drop-off area (Enclosure 3, Sheet SK-3). The proposed parking layout calls for 9' x 18' parking spaces set at 90° parking angles with 24'-wide aisles. Emergency vehicle access would be provided to the proposed field and around the entire perimeter on the proposed building.

An additional opening to Worcester Street (Route 9) would need to be provided in order to accommodate anticipated vehicular traffic flow and proper circulation through the site. In addition to parking, site lighting and ADA accessible walkways would be provided for the security and safety of the facility users.

**Utilities and Stormwater Management.** The proposed development was planned to have new utility services for domestic water, fire protection, sewer, gas and electric, all of which would tie into existing utility mains located within the Worcester Street (Route 9) right-of-way.

The proposed stormwater management system would collect stormwater runoff from all paved areas. The stormwater runoff would then be routed via piping from deep sump hooded catch basins to water quality treatment systems before entering a series of stormwater management basins. The deep sump hooded catch basins and water quality treatment systems would aid in Total Suspended Solids (TSS) removal by settling out sediment and preventing oils and floatables from continuing downstream. Treated overflow from the system would be discharged towards the existing wetlands. The proposed stormwater Best management Practices (BMPs) would attenuate as well as treat stormwater runoff and promote groundwater infiltration.

According to Town bylaws (Section XIVE, Part F.6), "all stormwater runoff from proposed impervious surfaces shall be recharged on-site unless, in conducting site plan review, it is determined that recharge is not feasible because of site conditions." The current design proposes to recharge the stormwater runoff through the use of the proposed synthetic turf field's engineered stone base (which has a 30% void ratio) and through the proposed stormwater management basins. Runoff from the roof areas could be piped directly into the infiltration systems. The extent of recharge provided may be limited due to the site's current unknowns such as high seasonal water table and permeability of the underlying soil. Exploratory test pits would be required to confirm the site's soil constraints.

#### **4. Traffic Assessment**

Gale completed a preliminary traffic assessment of traffic implications for the proposed development. Worcester Street (Route 9) is a four-lane primary arterial highway under state jurisdiction that traverses the study area in a general east-west direction, providing access to Interstate-95/Route 128 and the City of Boston to the east of the project site, and to the Massachusetts Turnpike (Interstate-90) and Interstate-495 to the west. Within this area, Route 9 provides four 11'-12-wide travel lanes separated by a raised median and guardrail, with 8'-wide marked shoulders provided along both sides of the roadway. Sidewalks are provided along both sides of the roadway, with illumination provided by way of streetlights mounted on metal poles.

The traffic characteristics of the proposed development were estimated using trip-generation statistics published by the Institute of Transportation Engineers (ITE). The ITE provides trip-generation information for various types of land uses developed as a result of scientific studies that have been conducted over the past 50-plus years. ITE Land Use Code (LUC) 465 – Ice Rink, ITE LUC 488 – Soccer Complex, and ITE LUC 495 – Recreational Community Center were used to develop the traffic characteristics of the proposed project. Table 1 summarizes the traffic characteristics of the proposed development (please refer to Enclosure 2).

As can be seen in Table 1, the proposed development is expected to generate approximately 1,025 vehicle trips on an average weekday, with 67 vehicle trips during the weekday morning peak hour, 119 vehicle trips during the weekday evening peak hour, and 111 vehicle trips during the weekend peak hour. Note that the above estimates do not reflect the use of car/vanpools, public transportation, or pedestrian/bicycle trips. It can also be assumed that a significant portion will be drop-off/pick-up trips. Incorporation of these alternative modes of transportation to the use of single-occupant vehicles would reduce the traffic volume estimates cited in Table 1.

A traffic impact study of the existing conditions along Route 9 and at the driveways serving the St. James parcel would need to be completed. The study should consist of an inventory of existing roadway geometrics, posted speed limits, sight distance measurements, an evaluation of historic motor vehicle crash data, and an evaluation of how the proposed development would impact existing traffic.

## **5. Construction Phasing Plan**

The implementation of the entire Proposed Plan may not be feasible in a single project due to Town's fiscal constraints. The Proposed Plan could therefore be broken into distinct projects based on reasonable annual budget expenditures, priority of need, and minimization of user impacts. The following is a possible phasing plan for the proposed multipurpose recreational facility development.

Phase I would involve the construction of a new multipurpose synthetic turf field, parking lot, walkways, and stormwater management system. The construction on the ice arena section and the common area section, would also be included as part of Phase I.

Since the natatorium section would not be constructed under this phase, the common area section would consist of the core building and areas related to the needs of the ice arena (concessions, lockers, retail with skate rental/pro shop). Areas related to the needs of the natatorium (spectator seating, fitness, lockers, etc.) can be left vacant during Phase I and fitted out final when the natatorium comes online.

The proposed phasing schematic for Phase I (Enclosure 3, SK-3A), also shows several temporary uses (such as a natural turf youth soccer field or areas designated for basketball and volleyball courts) for the area where the future natatorium section would be constructed.

Phase II would involve the construction of the natatorium section and the finishing of related areas within common area section. The mechanical room would also be converted to service the needs of the entire multipurpose recreation center.

## **6. Permitting Requirements**

**State and Local.** As was previously mentioned under the Existing Conditions section above, the project site is located within the Town's Single Family Residence District and Water Supply Protection District (see Enclosure 2, Figure 1), and according to Town Bylaws (Sections II and XIVE, Part D) the proposed use is allowable through Special Permit issued by the Town's Special Permit Granting Authority (SPGA).

According to Town Bylaws (Section XVIA), the proposed project would be considered a Major Construction Project and a Project of Significant Impact (PSI). As a result, the proposed project would require the following approvals from the Town: Design Review from the Design Review Board, Site Plan Review from the Zoning Board of Appeals (ZBA), and PSI approval by Special Permit issued by the Planning Board.

A State Highway Access Permit would be required from MassDOT for the construction of the new driveway openings along Route 9.

**Bordering Vegetated Wetlands.** A portion of the proposed structure and stormwater BMPs will fall within the wetland's 100' buffer zone. This would require the filing of a Notice of Intent (NOI) application with the Town of Wellesley's Wetlands Protection Committee and with the Massachusetts Department of Environmental Protection (MADEP) to demonstrate that the proposed development meets the Stormwater Management Standards as set by the Wetlands Protection Act Regulations, 310 CMR 10.00, and the Town's Wetlands Protection Bylaws.

**Bordering Land Subject to Flooding.** Land subject to flooding is considered a resource area and subject to protection under 310 CMR 10.57(1) (a) and (b). If the project involves removing, filling, dredging, or altering of Land Subject to Flooding (both Bordering and Isolated Areas), compensatory storage shall be provided for all flood storage volume that will be lost as the result of a proposed project.

A portion of the proposed structure would fall within a "Zone A" flood plain (see Enclosure 1, Figure 3). As a result, that portion under the proposed structure would have to be filled in order to raise the structure out of the flood plain. Compensatory storage could be provided within the stormwater management basins and within the void space of the proposed synthetic turf field's engineered stone base.

## **7. Summary of Project Feasibility, Assumptions, and Recommendations**

The following summarizes our findings and recommendations with respect to a proposed multipurpose recreational facility development at the St. James the Great parcel.

It is recommended that further assessment of the design requirements for the Route 9 access be completed with respect to additional driveway openings and determination of access, circulation, and safety considerations for the proposed parking facilities.

Test pits should be performed at the locations for the proposed structure and proposed stormwater BMPs. Permeability tests would also be required in proposed areas designated for stormwater recharge. The results from these tests would determine if the underlying soil conditions at the proposed locations are suitable to allow the site to drain properly and promote groundwater infiltration.

The edge of the existing bordering vegetative wetlands located on the southern portion of the site would have to be verified. A wetlands delineation would have to be performed to include the flagging and surveyed location of the flagging. The results from this delineation could affect the layout of the proposed structure and driveway areas, as well as the proposed stormwater BMPs.

In regards to existing utility locations, a new survey would be required so that actual utility locations, elevations, sizes, and conditions could be verified to confirm that they are in agreement with the current site conditions, that they do not conflict with the proposed layout design, and that there is adequate capacity to support the proposed development.

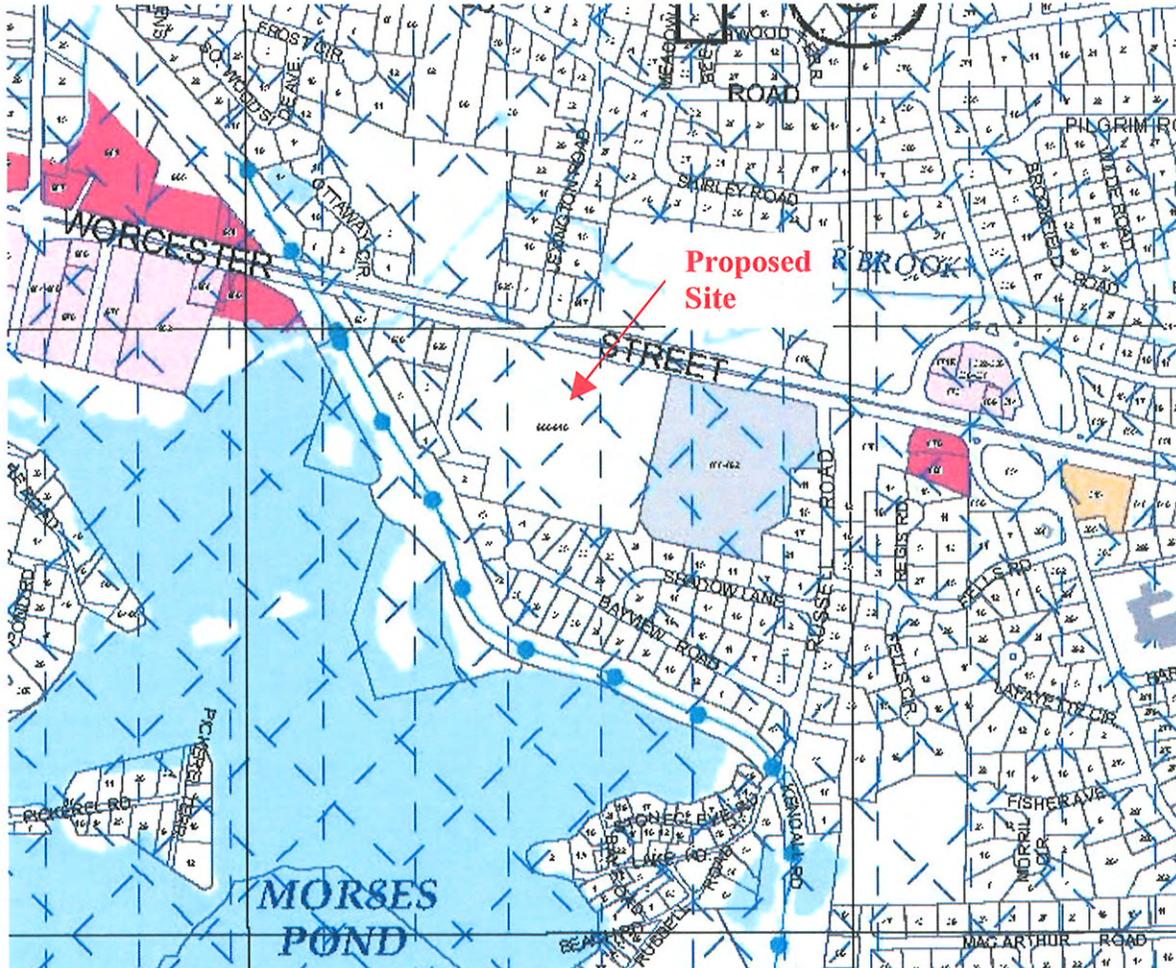
As noted above, assumptions in parking requirements and existing site conditions were made in the proposed layout design. The multipurpose recreation structure, parking lot and driveway designs may need to be revised if proposed existing site conditions are deemed not to be adequate to support current design. As was suggested in prior studies, in an effort to provide additional parking, the Town may want to explore the feasibility of coming to an agreement with the adjacent Wayne Office Park for shared parking usage during non-business hours.

A preliminary site development cost estimate has been included with this feasibility study. The preliminary cost estimate for the proposed development at full build out is approximately \$16,884,188. This includes the construction of a multipurpose synthetic turf field (approximately \$1,020,000), the construction of the ice arena (approximately \$4,233,000), the construction of the natatorium (approximately \$3,520,000), and the construction of the common area section (approximately \$3,712,500). A breakdown of the preliminary cost estimate for each proposed item can be seen at Enclosure 4. Again, this estimate is an approximation and more detailed construction cost estimates shall be prepared with the detailed design of each facility.

As a result of this study, the Town of Wellesley has a preliminary Master Plan for a multipurpose recreational facility development at the St. James the Great parcel which, when implemented, will result in a state-of-the-art facility which better meets the recreational needs of the Town now and in the future.



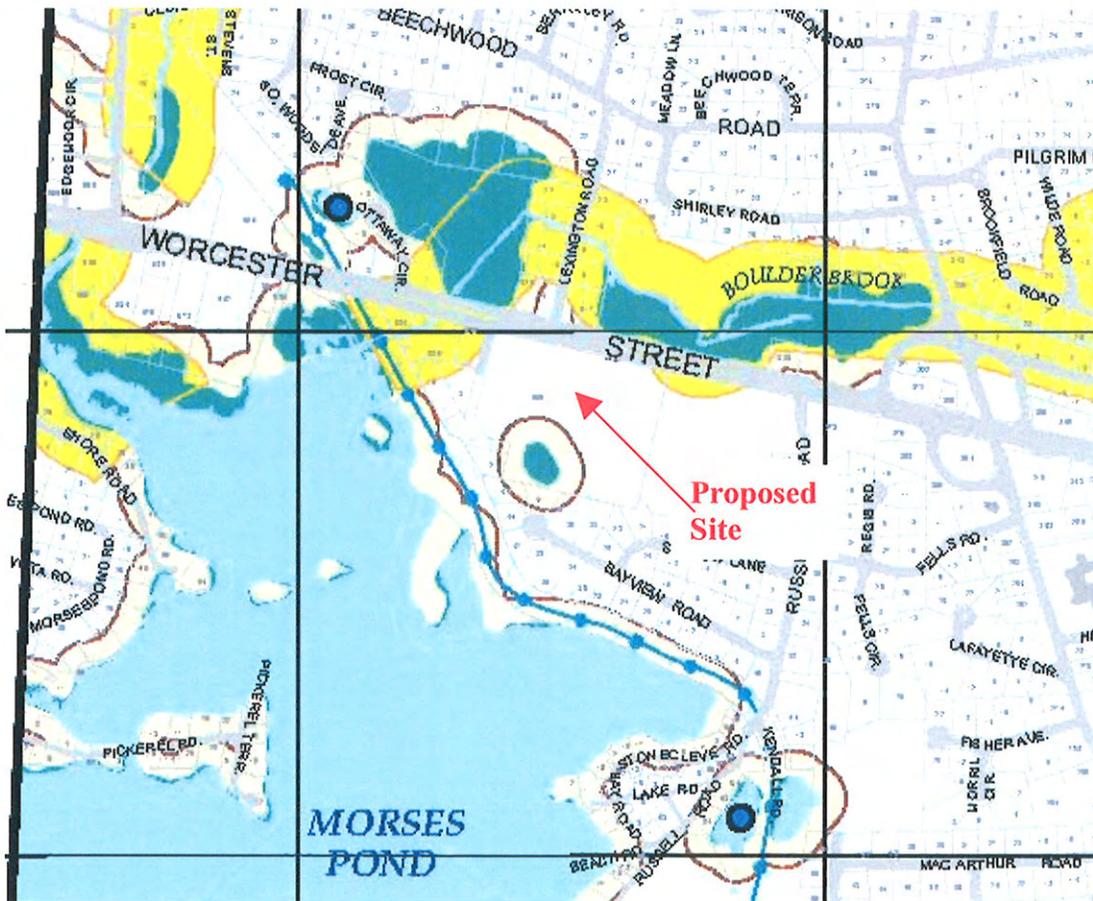
Fig. 1 – Town Zoning and Overlay Districts



- |                             |   |   |
|-----------------------------|---|---|
| Single Residence A          | Business A                              | Historic District                       |
| Multi-Family Residence      | Industrial                              | Residential Incentive Overlay District  |
| Town House                  | Industrial A                            | Water Supply Protection District        |
| General Residence           | Transportation                          | Linden Street Corridor Overlay District |
| Limited Residence           | Conservation                            |   |
| Limited Apartment           | Lower Falls Village Commercial District |   |
| Educational                 | Wellesley Square Commercial District    |   |
| Educational A               | Single Residence 10                     |   |
| Educational B               | Single Residence 15                     |   |
| Administrative/Professional | Single Residence 20                     |   |
| Limited Business            | Single Residence 30                     |   |
| Business                    | Single Residence 40                     |   |

Note:  
Refer to flood plain maps  
and watershed protection  
maps for adopted flood  
plain and watershed  
protection districts.

Fig. 2 – Town Wetlands Map

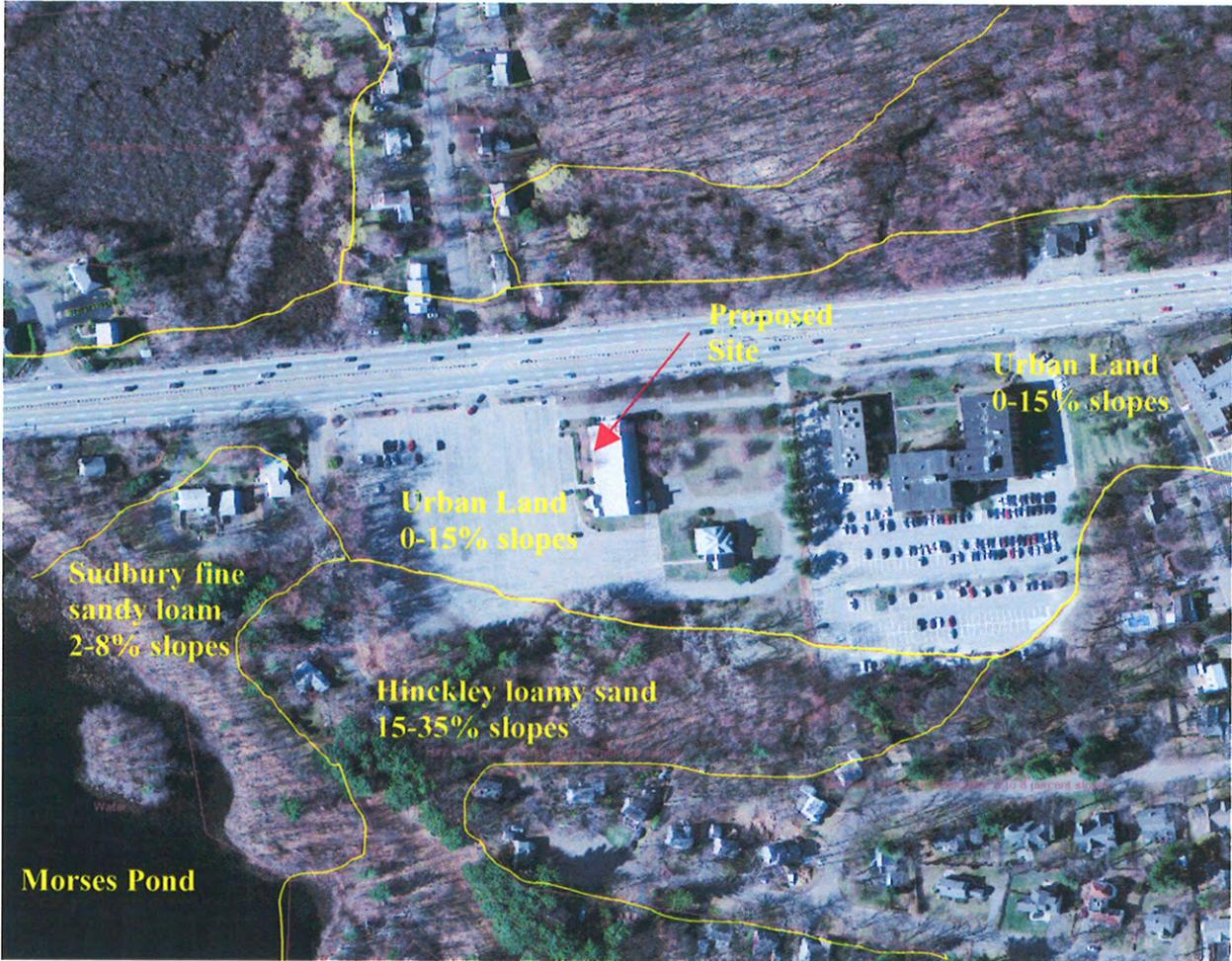


- |   |                            |   |                                    |
|---|----------------------------|---|------------------------------------|
|  | Open Water                 |  | NHESP Certified Vernal Pools       |
|  | Vegetated Wetlands         |  | Other Vernal Pools (Not Certified) |
|  | Wetland Buffer Zone (100') |   |                                    |
|  | Riverfront Area (200')     |   |                                    |

Fig. 3 – FEMA Flood Map, NHESP Atlas



Fig. 4 – NRCS Soils Map







**Table 1 - TRIP-GENERATION SUMMARY**

| Time Period/Direction         | Vehicle Trips                                  | Vehicle Trips                                   | Vehicle Trips |
|-------------------------------|--|---|---------------|
|                               | Multipurpose<br>Rectangular Field <sup>a</sup> | Multipurpose<br>Recreation Complex <sup>a</sup> | Totals        |
| Average Weekday<br>Daily:     |  |   |               |
| Total                         | 71   | 954   | 1025          |
| Weekday Morning<br>Peak Hour: |  |   |               |
| Entering                      | 2  | 42  | 44            |
| <u>Exiting</u>                | <u>1</u>                                       | <u>22</u>                                       | <u>23</u>     |
| Total                         | 3  | 64  | 67            |
| Weekday Evening<br>Peak Hour: |  |   |               |
| Entering                      | 14   | 33  | 47            |
| <u>Exiting</u>                | <u>8</u>                                       | <u>64</u>                                       | <u>72</u>     |
| Total                         | 22   | 97  | 119           |
| Weekend Peak Hour:            |  |   |               |
| Entering                      | 18   | 445   | 445           |
| <u>Exiting</u>                | <u>11</u>                                      | <u>251</u>                                      | <u>251</u>    |
| Total                         | 29   | 82  | 111           |

<sup>a</sup>Based on ITE LUC 465 - Ice Rink, ITE LUC 488 – Soccer Complex, ITE LUC 495 – Recreational Community Center

